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150th Anniversary of John Snow and the Pump Handle

John Snow, M.D. (1813–1858), a legendary figure in epidemiology, provided one of the earliest examples of using epidemiologic methods to identify risk for disease and recommend preventive action (*1*). Best known for his work in anesthesiology, Snow also had an interest in cholera and supported the unpopular theory that cholera was transmitted by water rather than through miasma (i.e., bad air).

On August 31, 1854, London experienced a recurrent epidemic of cholera; Snow suspected water from the Broad Street pump as the source of disease. To test his theory, Snow reviewed death records of area residents who died from cholera and interviewed household members, documenting that most deceased persons had lived near and had drunk water from the pump. Snow presented his findings to community leaders, and the pump handle was removed on September 8, 1854. Removal of the handle prevented additional cholera deaths, supporting Snow's theory that cholera was a waterborne, contagious disease. Despite the success of this investigation, the cause of cholera remained a matter of debate until *Vibrio cholerae* was isolated in 1883.

Snow's studies and the removal of the pump handle became a model for modern epidemiology. To recognize his pioneering work, this issue of *MMWR* highlights public health actions guided by epidemiologic data to control a modern epidemic of cholera, detect and prevent adverse reactions to vaccinations, stop an epidemic of aflatoxin poisoning, and correct environmental causes of waterborne outbreaks.

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Cholera Epidemic Associated with Raw Vegetables — Lusaka, Zambia, 2003–2004

Zambia experienced widespread cholera epidemics in 1991 (13,154 cases), 1992 (11,659), and 1999 (11,327) (*1*). In response to the large outbreak in 1999, the Zambian Ministry of Health (ZMOH) urged use of in-home chlorination with the locally produced solution, Clorin®, and the practice increased substantially Clorin® had been introduced in Zambia in 1998 as part of the Safe Water System (SWS), a point-of-use water disinfection and safe-water storage strategy* launched by the Society for Family Health, in partnership with ZMOH, the U.S. Agency for International Development, and CDC. Although no outbreaks were reported during 2000–2002, cholera remained endemic. Epidemic cholera returned to Zambia in November 2003, when cases of toxigenic *Vibrio cholerae* O1, serotype Ogawa, biotype El Tor were confirmed in the capital city, Lusaka. During November 28, 2003–January 4, 2004, an estimated 2,529 cholera cases and 128 cholera deaths (case-fatality rate [CFR] = 5.1%) occurred in Lusaka. In February 2004, the Lusaka District Health Management Team (LDHMT) invited CDC to assist in an

* Detailed information available at http://www.cdc.gov/safewater.

INSIDE

DEPARTMENT OF HEALTH AND HUMAN SERVICES
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investigation of the epidemic. This report summarizes the results of that investigation, which implicated foodborne transmission via raw vegetables and demonstrated a protective role for hand washing with soap. The results underscore the importance of hygiene, clean water, and sanitary food handling for cholera prevention.

In response to increasing cases, Zambian authorities began opening designated cholera-treatment centers (CTCs) in Lusaka in December 2003. All seven CTCs were functional by early January 2004, and all patients with suspected cholera were referred to these facilities. During January 5–March 1, an additional 2,101 cases and 25 deaths from cholera (CFR = 1.2%) were recorded at CTCs in Lusaka. Investigators conducted a matched case-control study to identify risk factors for cholera. A case was defined as watery diarrhea in a person aged ≥5 years, who was admitted to the Chawama (Figure) or Kanyama CTC during February 11–22. Stool cultures were performed for all eligible patients. Homes of enrolled patients were visited, and one age-, sex-, and neighborhood-matched control per case was selected systematically from neighboring households.

A total of 71 case-control pairs were enrolled in the study. *V. cholerae* O1 was identified in stool cultures from 52 (74%) patients. Both bivariate and multivariate analyses were performed, comparing all cases with culture-confirmed cases; because data were comparable for the two groups, results are reported for all cases in aggregate. The median age of patients was 27 years (range: 5–75 years); 58% were male. Common

FIGURE. Treatment and recovery tents at Chawama Cholera-Treatment Center, where more than 100 patients per day were treated at the peak of the epidemic — Lusaka, Zambia, 2004

Photo/CDC

symptoms, in addition to diarrhea, included vomiting (61 [86%]) and leg cramps (44 [62%]).

Bivariate analysis indicated that consumption of raw vegetables was associated with cholera (matched odds ratio [MOR] = 3.9; 95% confidence interval [CI] = 1.7–9.6; p = 0.0004). Hand soap was observed in 41 (58%) case homes and 64 (90%) control homes. Presence of hand soap was considered a proxy for actual hand washing and was determined to be protective (MOR = 0.14; 95% CI = 0.05–0.40; p = 0.0001). Consumption of kapenta, a local sardine-like dietary staple, also was protective (MOR = 0.35; 95% CI = 0.2–0.8; p = 0.005). Drinking untreated water was reported by 48 (67%) case-patients and 37 (52%) controls, but the association with disease did not reach statistical significance (MOR = 1.9; 95% CI = 0.9–3.9; p = 0.06). In-home chlorination of drinking water with Clorin® was reported by 48 (67%) controls and 47 (66%) case-patients. Free chlorine residuals were detected in stored water in 19 (27%) case homes and 14 (20%) control homes (MOR = 1.5; 95% CI = 0.7–3.3; p = 0.21).

Kapenta, raw vegetables, presence of soap, and in-home water treatment were included in a multivariate model. Water treatment, either by boiling or home chlorination, was not significantly protective. Consumption of raw vegetables remained significantly associated with cholera (adjusted odds ratio [AOR] = 4.7; 95% CI = 1.7–13.0). The presence of hand soap remained significantly protective against cholera (AOR = 0.1; 95% CI = 0.04–0.40), as did consumption of kapenta (AOR = 0.3; 95% CI = 0.1–0.7).

On the basis of these results, the Zambian Central Board of Health and LDHMT enhanced cholera-prevention efforts by reinforcing hand-washing promotion messages and recommending that vegetables be cooked or washed in treated water. Plans were created to improve hygiene and increase availability of latrines at Lusaka's major market to minimize cross-contamination of produce. Long-term prevention measures under discussion by local authorities include improving the quality and quantity of municipal water supplies. In April, cholera cases declined dramatically, and LDHMT closed the CTCs.

Reported by: *M Sinkala, MD, M Makasa, MD, F Mwanza, P Mulenga, Lusaka District Health Management Team, Zambia. P Kalluri, MD, R Quick, MD, E Mintz, MD, RM Hoekstra, PhD, Div of Bacterial and Mycotic Diseases, National Center for Infectious Diseases; A DuBois, MD, EIS Officer, CDC.*

Editorial Note: This month marks the 150th anniversary of the removal of the famed Broad Street pump handle after John Snow's classic study of epidemic cholera in London. Cholera is caused by toxigenic *V. cholerae*, serogroup O1 or O139. Infection can result in rapidly progressive, profuse, dehydrating diarrhea, with CFRs ≥22% when treatment is delayed (*2*). Cholera, which is still propagated by many of the same vehicles described by John Snow in the mid-1800s (*3*), remains a public health threat in sub-Saharan Africa and certain Asian countries. In 2003, the World Health Organization reported a total of 111,575 cholera cases and 1,894 deaths (CFR = 1.7%) in 45 countries; 97% of reported cases occurred in sub-Saharan Africa (*4*). In recent decades, the CFR of cholera has decreased because of dramatic improvements in oral and intravenous rehydration therapy (*5*).

In this epidemic of cholera, the primary mode of transmission was foodborne rather than waterborne, a possibility recognized by Snow (*3*). The implication of vegetables as a vehicle of transmission in this epidemic emphasizes the need for further assessment of produce hygiene during transport, delivery, and use in the home.

This investigation also documented the widespread acceptance of the SWS in cholera-affected communities in Lusaka. Implemented as a pilot project in Zambia in 1998, SWS has been determined to reduce the risk for diarrhea by ≥40% (*7*). The SWS consists of Clorin®, a dilute solution of locally produced sodium hypochlorite bleach, packaged and marketed for disinfection of water in the home, and promotion of plastic 20-liter jerricans for safe storage of treated water. The demand for Clorin® escalated during the 1999 cholera epidemic, and sales increased steadily in subsequent years. In 2003, approximately 1.7 million bottles of Clorin® were sold in Zambia. Findings of this investigation suggest that, 5 years after introduction of the SWS in Zambia, >20% of persons residing in Lusaka's shantytown purchase Clorin® solution and add it to their water.

The presence of soap in the home, which serves as a proxy for improved hygiene, was protective against cholera during this investigation. This finding is consistent with other studies that suggest hand washing reduces the risk for diarrhea by >40% (*8*) and echoes the work of Snow, who implicated poor hand hygiene in cholera transmission.

Approximately 50% of Zambia's 10 million residents live in cities. An estimated 60% of the 2 million residents of Lusaka reside in shantytowns without municipal water supplies or sewer systems (*9*). Snow's London of 1854 resembles numerous cities in the developing world today, where inadequate water and sanitation services and overcrowding contribute to a high burden of preventable diseases such as cholera. An estimated 1.1 billion persons in the world live without access to improved water supplies such as piped municipal systems; hundreds of millions more use inadequate systems, which

routinely provide water that is contaminated and unsafe. Waterborne transmission of enteric pathogens contributes to the estimated 2 million diarrheal deaths that occur among children aged <5 years each year (*10*). In recognition of this continuing problem, member states of the United Nations established a Millennium Development Goal for Water to reduce by half the proportion of persons without sustainable access to safe drinking water by 2015. To achieve this goal, an estimated 300,000 persons must gain access to safe drinking water each day for the next 11 years. Even if this challenge is met, more than half a billion persons will still lack access to safe drinking water. As in Snow's day, field epidemiology and practical prevention strategies remain critical to meeting public health challenges in the modern world.

Acknowledgments

The findings in this report are based in part on contributions by S Leuschner, C Robinson, P Kalenga, Society for Family Health, Lusaka; M Tembo, PhD, Tropical Diseases Research Center, Ndola; V Mukonka, MD, V Mtonga, MMED, Central Board of Health, Zambia. M Roulet, MD, J Vincent, World Health Organization, Geneva, Switzerland. S Sasaki, Japan International Cooperation Agency, Tokyo, Japan.

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Suspension of Rotavirus Vaccine After Reports of Intussusception — United States, 1999

On July 16, 1999, CDC recommended that health-care providers suspend use of the licensed rhesus-human rotavirus reassortant-tetravalent vaccine (RRV-TV) (RotaShield®, Wyeth Laboratories, Inc., Marietta, Pennsylvania) in response to 15 cases of intussusception (i.e., a bowel obstruction in which one segment of bowel becomes enfolded within another segment) among infants who received RRV-TV (*1*). The Vaccine Adverse Event Reporting System (VAERS) monitored for adverse events following licensure of RRV-TV on August 31, 1999. After the recommendation to suspend use of the vaccine, no additional cases were reported (*2*). This report describes the surveillance activities used to identify this vaccine adverse event, the emergency response, and follow-up investigations. Suspension of RRV-TV after the initial cases of intussusception parallels the removal of the Broad Street pump handle in response to John Snow's epidemiologic studies; both were decisive, life-saving public health actions.

VAERS, operated by CDC and the Food and Drug Administration (FDA), is a national passive surveillance system that monitors the safety of vaccines (*3*). Health-care providers, consumers, and vaccine manufacturers are encouraged to report adverse events involving all U.S.-licensed vaccines. During 1998–1999, CDC and FDA monitored VAERS for reports of intussusception and other severe gastrointestinal events among RRV-TV recipients. As a requirement for FDA licensure, the vaccine manufacturer funded a postlicensure phase IV trial of RRV-TV at Northern California Kaiser Permanente (NCKP) to monitor possible adverse events (*4*). Intussusception had been observed at low rates in prelicensure clinical trials, but a causal association with the vaccine was not proven; this information and a request for reporting to VAERS were included in the vaccine product label and recommendations of the Advisory Committee on Immunization Practices (ACIP).

During December 18, 1998–June 2, 1999, a total of 10 cases of intussusception were reported to VAERS (Figure 1). Four cases of intussusception involving other vaccines had been reported to VAERS during the preceding 8 years (*2,5*). The cases appeared to be nonrandom in distribution; among the majority of infants, intussusception occurred after receiving the first dose of RRV-TV and within 1 week after receiving any dose. The temporal clustering after receipt of RRV-TV suggested a causal relationship. These early findings prompted CDC to request data from NCKP and initiate two validation studies, a 19-state case-control study and case-series analysis

rec·om·men·da·tion: *n*

("rek-ə-mən-'dā-shən) 1 : something, such as a course of action, that is recommended; see also *MMWR*.

know what matters.

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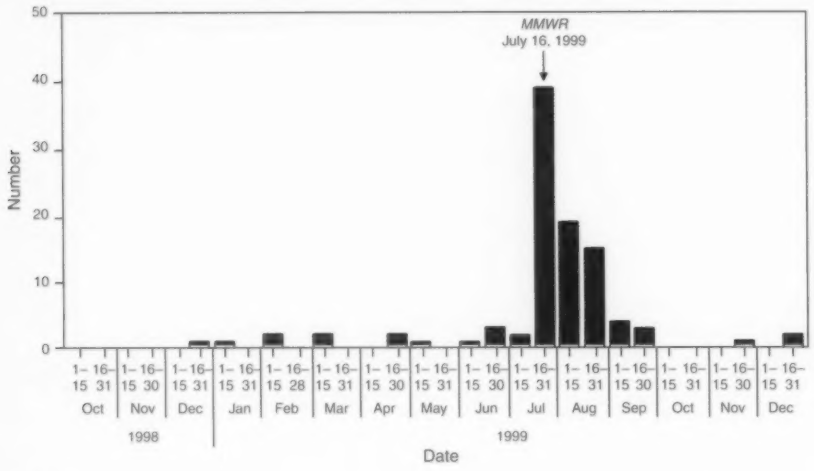
Recommendations and Reports

FIGURE 1. Number* of confirmed cases of intussusception after implementation of rhesus-human rotavirus reassortant-tetravalent vaccine, by date reported to the Vaccine Adverse Event Reporting System — United States, October 1, 1998–December 31, 1999



* n = 98.

(*6*), and a cohort study in 10 managed care organizations (*4*). CDC alerted ACIP on June 17, 1999.

By July 6, 1999, the number of cases reported to VAERS had increased to 15, a higher number than expected, accounting for likely underreporting, available baseline estimates of intussusception, and the estimated number of doses of RRV-TV distributed (*1*; Table). Preliminary data from both NCKP and from Minnesota, a state participating in one of the CDC studies, suggested a similar elevated risk for intussusception within the first week after RRV-TV vaccination (*4*). On July 16, 1999, in an *MMWR* report, CDC recommended temporarily suspending use of RRV-TV, pending the results of CDC studies that subsequently confirmed the initial observation that the greatest risk for intussusception was within 3–7 days after the first dose of RRV-TV (*4,6*).

By December 31, 1999, a total of 112 cases of intussusception with illness onset before August 15, 1999, had been reported to VAERS (Figure 2) 1 month after the suspension of the rotavirus vaccination program (*7*). Ninety-five cases among infants were confirmed by review of medical records, and three were confirmed by primary-care providers (*2*). No cases of RRV-TV–associated intussusception occurred in infants and children vaccinated after July 16, 1999. When the VAERS findings were confirmed by more definitive studies (*4,6*), the manufacturer voluntarily recalled the vaccine, and the ACIP recommendations were withdrawn in October 1999 (*2*).

Reported by: *Food and Drug Administration. J Iskander, MD, P Haber, MPH, TV Murphy, RT Chen, MD, Epidemiology and Surveillance Div, National Immunization Program; M Sabin, PhD, EIS Officer, CDC.*

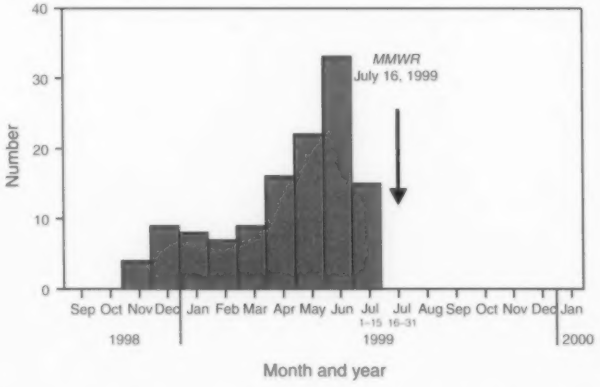
Editorial Note: The suspected association between RRV-TV and intussusception based on a review of VAERS data led CDC, in conjunction with state and local health departments, to implement a case-control study and case-series analysis (*6*) and a retrospective cohort study (*4*). These studies subsequently confirmed that intussusception was associated with RRV-TV in vaccine recipients. On the basis of evaluation of all available information, on February 21, 2002, ACIP reaffirmed its decision to withdraw the recommendation for use of RRV-TV in the United States (*8*).

The case-control study was conducted in 19 U.S. states among 429 infants and 1,763 matched controls. Infants who

TABLE. Number and percentage of cases of intussusception among rhesus-human rotavirus reassortant-tetravalent vaccine recipients reported to the Vaccine Adverse Events Reporting System before July 16, 1999, by selected characteristics — United States, 1999

Characteristic	Spontaneous reports (n = 15) No.	(%)
Intussusception after dose 1	13	(87)
Intussusception with 3–7 days' onset	12	(80)
Intussusception after dose 1 and 3–7 days' onset	11	(73)

FIGURE 2. Number* of intussusception reports among rhesus-human rotavirus reassortant-tetravalent vaccine recipients, by vaccination date — United States, September 1998–December 1999



* N = 112; includes cases of intussusception that occurred after any interval of vaccination.

received RRV-TV were 37 times more likely to have intussusception 3–7 days after the first dose than infants who did not receive RRV-TV (95% confidence interval [CI] = 12.6–110.1) (*6*). The population-based, retrospective cohort study among 463,277 children in managed care organizations demonstrated that of 56,253 infants vaccinated with RRV-TV, those who received the vaccine were 30 times more likely to have intussusception 3–7 days after the first dose than infants who did not receive the vaccine (95% CI = 8.8–104.9). The excess risk was estimated between one case in 5,000 vaccinees and one case in 11,000 vaccinees (*4,6*). In addition to intussusception (*5*), subsequent analysis of all VAERS reports documented a broader spectrum of gastrointestinal illnesses (e.g., bloody stool, vomiting, diarrhea, gastroenteritis, and abdominal pain) after receipt of RRV-TV.

Passive surveillance systems such as VAERS are subject to multiple limitations, including underreporting, reporting of purely temporal associations or unconfirmed diagnoses, lack of denominator data, and unbiased comparison groups (*2*). In addition, determining causal associations between vaccines and adverse events from VAERS reports is not possible. Nevertheless, because VAERS is a national surveillance system with a simple reporting mechanism, it yields timely information and has high sensitivity for new vaccine safety concerns. Despite estimated underreporting of intussusception after RRV-TV of approximately 50% (*7*), VAERS successfully provided an alert.

Recent reevaluations of the RRV-TV experience have assessed the strength of association, the attributable risk, and the possibility that RRV-TV triggered intussusception in those at risk (*8*). Follow-up of the managed care cohort showed equal risk for intussusception among vaccinated and unvaccinated infants >21 days postvaccination, arguing against the trigger hypothesis (*9*). Rotavirus infection is associated with increased distal ileum wall thickness and lymphadenopathy, suggesting a possible mechanism by which rotavirus infection or RRV-TV could cause intussusception (*10*).

Rotavirus is the most common cause of severe gastroenteritis in the United States, resulting in approximately 500,000 physician visits, 50,000 hospitalizations, and 20–40 deaths annually; worldwide, rotavirus accounts for an estimated 600,000 deaths annually among children aged <5 years (*3*). In the United States, where high routine vaccination coverage has nearly eliminated childhood vaccine-preventable diseases, concerns regarding vaccine safety are increasing. Rotavirus vaccines under development will be measured for safety by lessons learned from the RRV-TV/intussusception experience (*2,9*).

The causal association between RRV-TV and intussusception was established in the postlicensure period because a unique adverse event occurred shortly after vaccination, at a frequency (approximately one case per 10,000 doses) detectable by surveillance tools. This frequency contrasts with paralysis after oral poliovirus vaccine (no longer used in the United States) of one case in 750,000–1.2 million doses. Evaluation of other vaccine safety concerns, which include disorders involving delayed/insidious onset (e.g., autism) or other diseases (e.g., yellow fever vaccine–associated viscerotropic and neurotropic disease) in smaller populations, is more challenging. CDC and FDA will continue to develop new surveillance tools for timely detection of rare or unanticipated vaccine adverse events and to ensure confidence in vaccination.

The investigation of RRV-TV and intussusception had 145 years of historical precedent in John Snow's epidemiologic methodology. The rapid elimination of risk based on systematic investigation, surveillance, and ongoing scientific confirmation averted any other cases of intussusception associated with RRV-TV.

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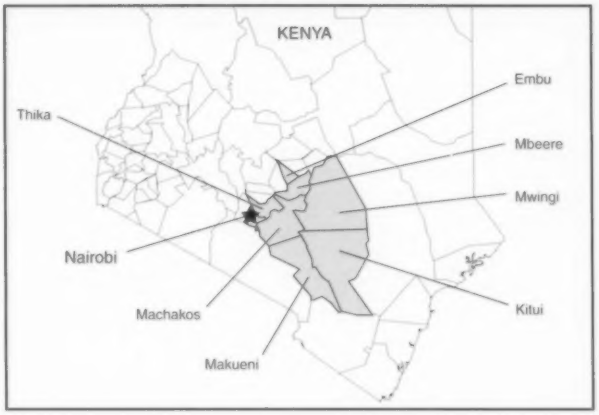
Outbreak of Aflatoxin Poisoning — Eastern and Central Provinces, Kenya, January–July 2004

In May 2004, CDC Kenya, trainees of the CDC-supported Field Epidemiology and Laboratory Training Program (FELTP) in Kenya, the World Health Organization, and CDC were invited by the Kenya Ministry of Health (KMOH) to participate in the investigation of an outbreak of jaundice with a high case-fatality rate (CFR) in the districts of Makueni and Kitui, Eastern Province. Preliminary laboratory testing of food collected from the affected area revealed high levels of aflatoxin, suggesting that the outbreak was caused by aflatoxin poisoning, as was a previous outbreak in the same area in 1981 (*1*). In the United States, aflatoxin concentrations are limited to 20 parts per billion (ppb), a level also adopted by Kenyan authorities. The 2004 outbreak resulted from widespread aflatoxin contamination of locally grown maize, which occurred during storage of the maize under damp conditions. Urgent replacement of the aflatoxin-contaminated maize with noncontaminated maize proved to be a critical intervention; however, as of July 21, a limited number of new cases continued to be detected. This report summarizes the preliminary results of the outbreak investigation. Aflatoxin poisoning likely will continue to be a public health problem until culturally appropriate storage methods for dry maize are implemented by the local population. In addition, enhanced surveillance for human aflatoxin poisoning and testing of commercially sold maize for aflatoxin levels will lead to long-term improvements in public health.

Joint KMOH and CDC teams conducted patient interviews and reviewed medical records dating back to January 1, in three health facilities in the Makueni and Kitui districts. Additional case finding was conducted through similar patient interviews and retrospective record reviews in seven health facilities in adjacent districts of Eastern Province (Machakos, Embu, Mbeere, and Mwingi districts) and Central Province (Thika district) and at Kenyatta National Hospital in Nairobi (Figure 1). Large-scale active surveillance occurred from early May to late June. As of July 21, three health facilities in Makueni and Kitui districts continued to be monitored for new cases. A convenience sample of 20 patient households was visited to assess the occurrence of jaundice in nonhospitalized household members and to inspect food quality and storage. In this investigation, a case of suspected aflatoxin poisoning was defined as a case of acute jaundice that occurred after January 1, in a resident of Eastern or Central Province or a case diagnosed at Kenyatta National Hospital in a patient who was not known to have chronic liver disease or any other cause of jaundice.

FIGURE 1. Districts affected by aflatoxicosis outbreak — Eastern and Central Provinces, Kenya, January–July 2004

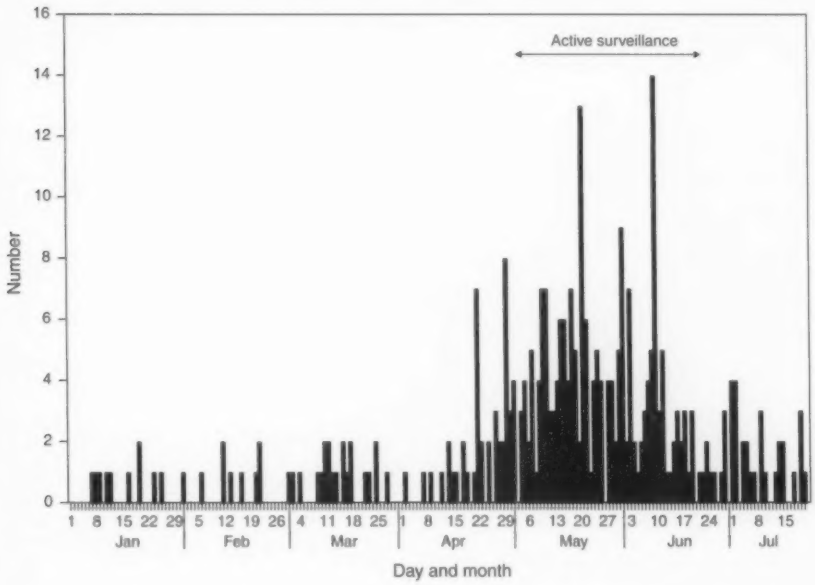


As of July 20, a total of 317 cases had been reported, with 125 deaths (CFR = 39%). An increase in case reports began in the third week of April, with new cases continuing to occur through mid-July (Figure 2). Of the 308 patients for whom age data were available, 68 (22.1%) were aged <5 years; 90 (29.2%) were aged 5–14 years, and 150 (48.7%) were aged ≥15 years. Of the 317 total patients, 178 (56.2%) were male, and 280 (88.3%) resided in four districts: Makueni (148 [46.7%]), Kitui (101 [31.8%]), Machakos (19 [6.0%]), and Thika (12 [3.8%]). The remaining 37 (11.7%) patients had aflatoxicosis diagnosed at Kenyatta National Hospital in Nairobi or at health facilities in Embu, Mbeere, or Mwingi districts. CFR was significantly higher in Makueni district (CFR = 49.3%) than in Kitui district (CFR = 23.7%) (CFR ratio = 2.1; 95% confidence interval [CI] = 1.4–3.1).

Preliminary results from a case-control study that compared 40 case-patients with 80 well controls matched by village in Makueni and Kitui districts demonstrated a statistically significant association between the development of jaundice and several risk factors or markers, including 1) reported consumption of cooked maize kernels (odds ratio [OR] = 8.0; 95% CI = 1.7–37.1), 2) reported possession of homegrown maize that was discolored or visibly contaminated with mold (OR = 5.9; 95% CI = 1.9–18.2), 3) consumption of homegrown maize (OR = 3.0; 95% CI = 1.0–8.8), 3) storage of damp maize (OR = 3.5; 95% CI = 1.2–10.3), 4) inside storage of maize rather than outside granary storage (OR = 12.0; 95% CI = 1.5–95.7), and 5) reported deaths of dogs or livestock (OR = 3.3; 95% CI = 1.2–9.1).

Food samples collected from household visits during May 10–19 included maize flour, maize grains, dry maize cobs, muthokoi (i.e., maize in which the outer hulls have been removed), millet, sorghum, and beans. A total of 31 samples were

FIGURE 2. Number of aflatoxicosis cases, by date of reporting — Eastern and Central Provinces, Kenya, January–July 2004



tested by the Kenya National Public Health Laboratory Services, and 15 had >20 ppb aflatoxin B_1 (range: 20–8,000 ppb).

A representative survey of maize products from agricultural markets and outlets (Figure 3) in Makueni, Kitui, Thika, and Machakos districts was conducted to assess the extent and magnitude of aflatoxin contamination in the sampled maize. Preliminary results indicated widespread, high-level aflatoxin contamination. A total of 182 (53.2%) of 342 samples had >20 ppb of aflatoxin. In addition, a substantial percentage of samples from each district had aflatoxin levels >1,000 ppb: Makueni (12.1%), Kitui (9.6%), Thika (3.9%), and Machakos (2.9%).

The government of Kenya is providing replacement food in the most heavily affected districts: Makueni district (population: 771,545) and Kitui district (population: 515,422). Residents of affected districts have been advised to avoid consumption of maize or other foods suspected to be moldy or appearing discolored. In addition, food inspections by public health authorities are being conducted, and suspect food is being seized, destroyed, and replaced. Surveillance for possible aflatoxin poisoning in humans has been extended to other parts of Kenya by MOH, and aflatoxin screening of maize has been increased.

Reported by: *J Nyikal, A Misore, C Nzioka, C Njuguna, E Muchiri, J Njau, S Maingi, J Njoroge, J Mutiso, J Onteri, A Langat, IK Kilei, J Nyamongo, G Ogana, B Muture, Aflatoxin Task Force, Kenya Ministry of Health; P Tukei, C Onyango, W Ochieng, Kenya Medical Research Institute; C Tetteh, S Likimani, P Nguku, T Galgalo, S Kibet, A Manya, A Dahiye, J Mwihia, I Mugoya, Kenya Field Epidemiology and Laboratory Training Program/Kenya Ministry of Health. J Onsongo, A Ngindu, World Health Organization Kenya Country Office. KM DeCock, K Lindblade, L Slutsker, P Amornkul, D Rosen, D Feiken, T Thomas, CDC Kenya. P Mensah, N Eseko, A Nejjar, World Health Organization Regional Office for Africa. M Onsongo, F Kessel, Foreign Agricultural Svc, U.S. Dept of Agriculture. H Njapau, DL Park, Center for Food Safety and Applied Nutrition, Food and Drug Administration. Div of International Health, Epidemiology Program Office; L Lewis, G Luber, H Rogers, L Backer, C Rubin, National Center for Environmental Health; KE Gieseker, E Azziz-Baumgartner, W Chege, A Bowen, EIS officers, CDC.*

Editorial Note: Evidence that this outbreak resulted from aflatoxin poisoning included 1) high levels of aflatoxin (up to 8,000 ppb) in maize samples collected from patient households, 2) a clinical illness consistent with acute aflatoxin poisoning, 3) clustering of cases among residents of the same household, and 4) reports of deaths among animals known to

FIGURE 3. A posho (maize flour) mill — Makueni district, Eastern Province, Kenya, 2004

Photo/CDC

have eaten the same maize as the patients during the same period. Serum specimens from a convenience sample of seven patients were tested for differential viral etiologies. All seven patients had negative serologic tests for yellow fever, dengue, West Nile virus, Rift Valley fever, Chikungunya and Bunyamwera viruses, acute hepatitis A, acute hepatitis B, and hepatitis C.

Aflatoxins are a group of metabolic products formed by two species of fungus, *Aspergillus flavus* and *A. parasiticus*, in several agricultural commodities, including corn or maize. Two structural types of aflatoxins are known (B and G types), of which aflatoxin B_1 is considered the most toxic and was the type most commonly found in Kenya during this outbreak. Exposure to aflatoxins occurs primarily through ingestion of contaminated foods (*2*) and can cause hepatic and gastrointestinal injury and have immunosuppressive, teratogenic, and oncogenic effects. Chronic low-level aflatoxin exposure can increase the risk for hepatocellular carcinoma (*3*). Severe, acute liver injury with high morbidity and mortality has been associated with high-dose exposures to aflatoxins (*4*). Ingestion of 2–6 mg/day of aflatoxin for a month can cause acute hepatitis and death (*5,6*).

The largest reported outbreak of aflatoxicosis to date occurred in western India in 1974, resulting in 397 recognized cases and 106 deaths (*6*). The ongoing epidemic in Kenya already has resulted in 125 recognized deaths. Because of the remoteness of villages in the affected districts in Kenya and the large geographic area involved, case finding has been limited to medical facilities. In addition, because some persons might not have been able to reach health-care facilities for diagnosis and treatment, the true magnitude of this outbreak is likely to be considerably greater than reported.

An outbreak of acute aflatoxicosis (20 cases; CFR = 60%) was reported previously in Makueni district, Eastern Province, Kenya, in 1981 (*1*). Patients were clustered in family groups that shared meals consisting of aflatoxin-contaminated maize (1,600–12,000 ppb). Acute hepatitis associated with consumption of moldy grains also has been reported in other areas in Africa, Western India, and Malaysia (*6–8*), where affected persons came from areas prone to drought and malnutrition and unseasonable rains forced the harvest of grains before adequate drying had occurred. Typically, increased reports of jaundice and hepatitis followed within weeks of such harvests (*6–8*). Locally produced maize associated with this outbreak was harvested in February during peak rains, and the first illnesses were reported in Makueni district in late March and early April.

For every symptomatic case of aflatoxicosis identified, several other persons likely were exposed to unsafe levels of aflatoxin and might face future adverse health consequences. In addition, individual cases or clusters of aflatoxin poisoning likely occur regularly but are not recognized. Efforts should focus on the prevention of aflatoxin exposure by implementing extensive food replacement, without which, the epidemic can be expected to continue. Longer-term requirements include strengthened surveillance; increased food inspections to ensure food safety; and local education and assistance to ensure that maize is harvested correctly, dried completely, and stored properly.

This report describes the first investigation by the Kenya FELTP, a partnership of CDC, KMOH, and Jomo Kenyatta University of Agriculture and Technology intended to build public health, epidemiologic, and laboratory capacity in Kenya. This investigation provided field experience to these Kenyan public health workers in training and exemplified collaboration between different national and international agencies and among various sectors and disciplines, including health, agriculture, food safety, nutrition, and humanitarian relief. Increased collaboration between the health sector and others involved in food security and safety could enable early warning of high levels of aflatoxins.

As a result of widespread drought, Kenya faces an acute food shortage, with nearly 1.8 million persons in 26 districts vulnerable to food insecurity (*9*), including persons in the area most heavily affected by the aflatoxicosis outbreak. Because an estimated 166,000 metric tons of food will be required to meet the requirements of emergency and school feeding programs during August 2004–January 2005, public health officials should be vigilant to a possible wider aflatoxicosis outbreak resulting from the large-scale storage and distribution of certain emergency food supplies.

Acknowledgments

The findings in this report are based, in part, on contributions by Makindu Sub-District Hospital, Makueni district, Mutomo Mission Hospital, Kitui district, other health facilities, staff at the National Public Health Laboratory Svcs, Kenya.

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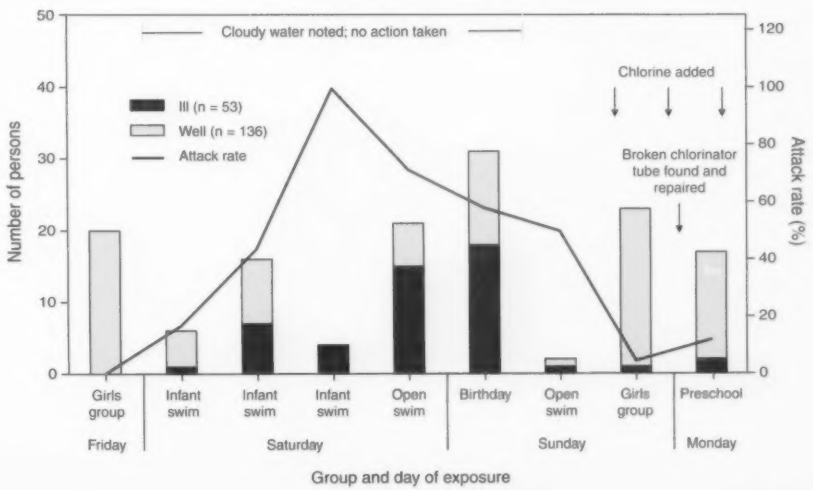
An Outbreak of Norovirus Gastroenteritis at a Swimming Club — Vermont, 2004

John Snow's historic investigation of a severe epidemic of cholera traced the cause of infection to a common water source (*1*). Today, 150 years later, waterborne diseases remain a public health problem, and similar investigations are used to identify the source of infection. On February 3, 2004, the Vermont Department of Health (VDH) was notified of an outbreak of acute gastroenteritis among children whose only common exposure was attendance at a swimming club the previous weekend (January 31–February 1). This report summarizes the results of an investigation conducted by VDH and CDC, which determined the cause of the outbreak to be a combination of stool contamination, a blocked chlorine feed tube, and multiple lapses of pool-maintenance procedures. The findings underscore the importance of correct pool maintenance for rapid identification of water-quality problems to prevent outbreaks of swimming pool–associated illness.

Pool attendance records were available for review for the period from Friday evening, January 30, to Monday noon, February 2, 2004. During this time, seven private groups used the pool, including three mother-infant swimming classes, two groups from a local girls' organization, a birthday party of children aged 5–10 years, and a preschool class. In addition, members of the club used the pool during two defined open-swim sessions. The seven private groups ranged in size from four to 31 persons. The group leader for each event provided a roster of attendees. An adult in each household was contacted by telephone and asked to identify family members who attended events at the swimming club and to question them about recent gastrointestinal illness by using a standardized questionnaire. Family members who reported recent gastrointestinal illness were asked to submit stool specimens for laboratory testing. Respondents also were asked to describe the appearance of the pool water at the time of their visit. A case was defined as vomiting or diarrhea (i.e., ≥3 loose stools within a 24-hour period) that occurred in a person within 72 hours of visiting the swimming club.

Of the 189 persons for whom information was collected and who visited the pool during the outbreak period, median age was 13 years (range: 5 months–73 years); 53 (28%) reported an illness consistent with the case definition. Among these 53 persons, onset of symptoms began a median of 30 hours (range: 8–62 hours) after attending an event at the club and included vomiting (89%), diarrhea (50%), nausea (77%), stomach cramps (68%), chills (58%), and a fever of ≥100.4° F (≥38° C) (53%). The median age of patients was 7 years (range: 5 months–61 years); 31 (58%) were female. Six persons (five children and one adult) sought medical care from their physicians, and one adult was hospitalized with severe vomiting. Of the 10 stool specimens tested, five were positive for norovirus by reverse transcription-polymerase chain reaction (RT-PCR). Three strains were characterized further and determined to share identical nucleotide sequences. The highest attack rates were observed among persons who visited the pool on Saturday or Sunday (Figure). No one who attended Friday's event became ill, and by Sunday afternoon, the attack

FIGURE. Number of well and ill persons and attack rates of acute gastroenteritis, by exposure group and day — Vermont, January 30–February 2, 2004



rates had declined sharply. No obvious source of contamination was identified: all infants were reported to have worn swim diapers while in the pool, no vomiting or fecal incidents were reported, and no persons, when questioned, reported gastrointestinal illness in the 2 weeks before visiting the pool. Attending an event at the club on Saturday or Sunday (versus Friday or Monday, relative risk [RR] = 7.7; 95% confidence interval [CI] = 2.0–30.0; p = 0.003) and going into the pool (RR = 6.0; 95% CI = 1.6–23.0; p = 0.009) increased risk for illness.

Interviews with swimmers and staff indicated that the water was visibly cloudy throughout Saturday and on Sunday morning (Figure), when the regular maintenance person was not on duty and pool usage was the highest. No action was taken until Sunday afternoon, when the pool was hyperchlorinated (i.e., "shocked") twice. Analysis of a water sample collected on Monday morning demonstrated low free residual chlorine (0.5 parts per million [ppm]; normal range: 1–4 ppm) and low pH (6.8; ideal range: 7.4–7.6), indicating suboptimal disinfection. A kink in the tube that supplies chlorine to the pool was subsequently identified and repaired by the pool-maintenance manager. The pool was hyperchlorinated again Monday night, and the pH was corrected to optimize chlorine efficacy.

The pool was equipped with an automated chlorine feeder and filtration system and was monitored and maintained by lifeguards and a maintenance worker. On Tuesday, February 3, a comprehensive environmental health systems review of the pool equipment, maintenance, and operations was conducted. At the time of the review, although disinfection equipment was working properly and pool chlorine, pH, and temperature were consistent with recommended national standards (*2*), multiple lapses and inadequacies in pool management were identified. Of these, most remarkable were a lack of staff training and response policies and the absence of records of pool-chemistry monitoring results or pool maintenance.

Reported by: *L Zanardi Blevins, MD, D Itani, MS, A Burns, C Lohff, MD, S Schoenfeld, MSPH, W Knight, N Thayer, J Oetjen, PhD, N Pugsley, Vermont Dept of Health. C Otto, Environmental Health Svcs, National Center for Environmental Health; M Beach, PhD, Div of Parasitic Diseases; M-A Widdowson, VetMB, J Bresee, MD, R Glass, MD, S Monroe, PhD, L Browne, MPH, S Adams, Div of Viral and Rickettsial Diseases, National Center for Infectious Diseases; M Amundson, DVM, LJ Podewils, PhD, EIS officers, CDC.*

Editorial Note: Whereas classical infectious disease epidemiologic methods were used to identify and characterize this outbreak and the risk factors for illness, several failures in the environmental health systems likely led to the outbreak. First, inadequate monitoring of water quality by the pool staff resulted in critical delays in detecting the chlorinator-tube malfunction. Second, although the pool staff and patrons noticed cloudy, turbid water in the pool, the maintenance staff was not notified, which further delayed implementation of control measures, such as hyperchlorination, for more than 24 hours. Third, none of the pool staff had formal training in pool disinfection. Appropriate monitoring, operation, and response protocols could have prevented this outbreak or reduced the duration of virus transmission. Only on Monday, when low free residual chlorine and pH were measured, despite hyperchlorination the previous day, was the defective chlorinator discovered. Repair of the defective chlorination system and return of the pool water to recommended disinfection standards were associated with resolution of this outbreak. The findings underscore the importance of free residual chlorine concentration and proper pH in the prevention of illnesses associated with recreational water use.

Although no obvious source of norovirus was determined, the epidemic curve and laboratory data were consistent with a single contamination event such as fecal incontinence that occurred on either Friday night or Saturday morning. Previous outbreaks of enteric infections associated with recreational water have occurred with no obvious contamination event (*3,4*).

Norovirus remains the most common cause of epidemic gastroenteritis in the United States, causing an estimated 23 million cases each year (*5*). Challenges to prevention of norovirus-associated outbreaks include the low infectious dose, the multiple modes of transmission (e.g., person-to-person, foodborne, and waterborne), the absence of long-lasting immunity, and the diversity of strains that do not confer heterotypic protection. Although waterborne outbreaks of norovirus gastroenteritis are much less commonly reported than foodborne outbreaks (*6*), the recorded incidence of norovirus-associated waterborne disease is likely an underestimate because of the lack of simple diagnostic technology. However, norovirus outbreaks associated with swimming pools rarely are reported (*7*).

Pool-care guidelines are available from the National Spa and Pool Institute (*2*) and the state of Vermont; however, use of these guidelines is voluntary. In addition, CDC provides guidelines on how to avoid the risk for infectious illness when swimming (*8*). Although prevention of norovirus outbreaks is difficult, this outbreak investigation suggests that staff training, pool-chemistry monitoring, and maintenance of appropriate disinfectant levels are important prevention strategies. As with John Snow's Broad Street cholera outbreak, a series of environmental health failures occurred, creating conditions that could convey almost any waterborne pathogen. Findings from this investigation highlight the need for review of

appropriate guidelines and methods to ensure pools are properly maintained and underscore the utility of environmental health investigations for providing data for development of prevention guidelines.

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West Nile Virus Activity — United States, August 25–31, 2004

During August 25–31, a total of 210 cases of human West Nile virus (WNV) illness were reported from 14 states (Arizona, California, Florida, Illinois, Indiana, Kansas, Maryland, Minnesota, Montana, Nevada, New Mexico, North Dakota, Oklahoma, and Pennsylvania).

During 2004, a total of 36 states have reported 1,053 cases of human WNV illness to CDC through ArboNET (Table, Figure). Of these, 326 (31%) cases were reported from California, 316 (30%) cases were reported from Arizona, and 141 (13%) cases were reported from Colorado. A total of 588 (56%) of the 1,053 cases occurred in males; the median age of patients was 51 years (range: 1 month–99 years). Illness onset ranged from April 23 to August 24; a total of 28 cases were fatal.

A total of 85 presumptive West Nile viremic blood donors (PVDs) have been reported to ArboNET in 2004. Of these, 36 (42%) were reported from Arizona, 20 from California, eight from New Mexico, six from Texas, three each from Florida and South Dakota, two from Colorado and Wisconsin, and one each from Illinois, Iowa, Louisiana, Minnesota, and Missouri . Of the 85 PVDs, three persons aged 42, 66 and 69 years subsequently had neuroinvasive illness, and 15 persons (median age: 55 years; range: 17–73 years) subsequently had West Nile fever.

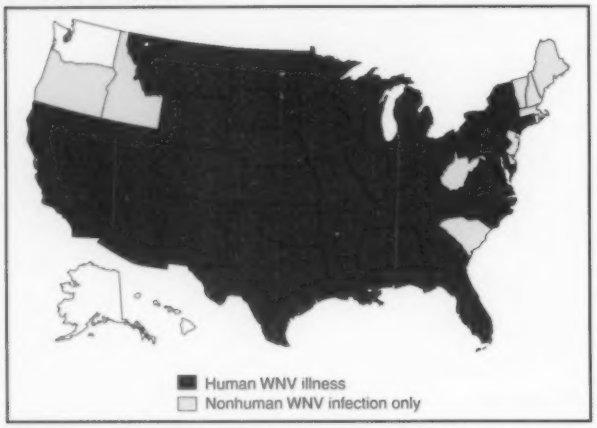
TABLE. Number of human cases of West Nile virus (WNV) illness, by state — United States, 2004*

State	Neuroinvasive disease†	West Nile fever§	Other clinical/ unspecified¶	Total reported to CDC**	Deaths
Alabama	7	0	0	**7**	0
Arizona	125	31	160	**316**	4
Arkansas	1	2	0	**3**	0
California	85	126	115	**326**	9
Colorado	23	118	0	**141**	2
Connecticut	0	1	0	**1**	0
Florida	16	3	0	**19**	1
Georgia	2	0	1	**3**	0
Illinois	9	4	1	**14**	0
Indiana	2	0	0	**2**	0
Iowa	2	2	2	**6**	1
Kansas	10	0	0	**10**	0
Kentucky	0	2	0	**2**	0
Louisiana	30	4	0	**34**	3
Maryland	2	1	0	**3**	0
Michigan	2	0	0	**2**	0
Minnesota	8	6	0	**14**	0
Mississippi	5	1	1	**7**	2
Missouri	4	1	1	**6**	0
Montana	1	3	0	**4**	0
Nebraska	0	1	0	**1**	0
Nevada	16	8	1	**25**	0
New Mexico	13	20	4	**37**	1
New York	2	1	0	**3**	0
North Carolina	1	0	0	**1**	0
North Dakota	1	13	0	**14**	1
Ohio	2	0	0	**2**	1
Oklahoma	2	1	0	**3**	1
Pennsylvania	1	1	0	**2**	0
South Dakota	4	16	0	**20**	0
Tennessee	3	0	0	**3**	0
Texas	8	2	0	**10**	2
Utah	2	2	0	**4**	0
Virginia	1	0	1	**2**	0
Wisconsin	0	1	0	**1**	0
Wyoming	1	4	0	**5**	0
Total	**391**	**375**	**287**	**1,053**	**28**

* As of August 31, 2004.
† Cases with neurologic manifestations (i.e., West Nile meningitis, West Nile encephalitis, and West Nile myelitis).
§ Cases with no evidence of neuroinvasion.
¶ Illnesses for which sufficient clinical information was not provided.
** Total number of human cases of WNV illness reported to ArboNet by state and local health departments.

In addition, during 2004, a total of 3,307 dead corvids and 671 other dead birds with WNV infection have been reported from 44 states. WNV infections have been reported in horses from 31 states (Alabama, Arizona, Arkansas, California, Colorado, Florida, Georgia, Idaho, Illinois, Iowa, Kansas, Kentucky, Michigan, Minnesota, Mississippi, Missouri, Montana, Nevada, New Mexico, North Carolina, Ohio, Oklahoma, Oregon, South Dakota, Tennessee, Texas, Utah, Virginia, Wisconsin, West Virginia, and Wyoming) and in five dogs from Nevada and New Mexico. Three unidentified animal species with WNV infection were reported from Illinois, Iowa, and Nevada. WNV seroconversions have been reported in 571 sentinel chicken flocks from 11 states (Arizona,

FIGURE. Areas reporting West Nile virus (WNV) activity — United States, 2004*



* As of 3 a.m., Mountain Standard Time, August 31, 2004.

Arkansas, California, Delaware, Florida, Iowa, Louisiana, Nebraska, Nevada, South Dakota, and Utah) and in two wild hatchling birds from Ohio. Three seropositive sentinel horses were reported from Puerto Rico. A total of 4,024 WNV-positive mosquito pools have been reported from 31 states (Arizona, Arkansas, California, Colorado, Connecticut, Georgia, Illinois, Indiana, Kansas, Kentucky, Louisiana, Maryland, Massachusetts, Michigan, Mississippi, Missouri, Montana, Nebraska, Nevada, New Jersey, New Mexico, New York, Ohio, Oklahoma, Pennsylvania, South Dakota, Tennessee, Texas, Utah, Virginia, and Wisconsin).

Additional information about national WNV activity is available from CDC at http://www.cdc.gov/ncidod/dvbid/westnile/index.htm and at http://westnilemaps.usgs.gov.

Notice to Readers

Nosocomial *Burkholderia cepacia* Infections Associated with Exposure to Sublingual Probes — Texas, 2004

On August 27, this notice was posted as an MMWR Dispatch *on the* MMWR *website* (http://www.cdc.gov/mmwr).

Burkholderia cepacia (formerly known as *Pseudomonas cepacia*, a gram-negative rod [GNR]) is attributed to nosocomial infections among intensive care unit patients and associated with use of contaminated equipment and solutions (*1–4*). In August 2004, the Texas Department of Health received reports of positive cultures for *B. cepacia* from respiratory samples of 13 intensive care unit patients receiving mechanical ventilation at a hospital in Texas during April–August 2004. None of the patients had cystic fibrosis, a condition commonly associated with *B. cepacia*. Initial investigation by the hospital's infection-control team revealed that nearly all of the patients had been exposed to a sublingual probe indicated for use for monitoring tissue carbon dioxide levels. The probe, an SLS-1 Sublingual Sensor, is part of the Nellcor® CapnoProbe™ Sublingual System (model N-80 monitor), an FDA-regulated medical device (Nellcor, Pleasanton, California). Each probe is packaged in a metal canister filled with a buffered saline solution and sealed in a foil envelope labeled as nonsterile. Each disposable sensor is used only once.

Cultures of the buffered saline solution from at least two lots of unopened probes yielded *B. cepacia* and other GNRs. *B. cepacia* isolates from some patients and unopened sensor canisters were indistinguishable by pulsed field gel electrophoresis analysis at the Texas Department of Health laboratory. Investigations into other reports of *B. cepacia* and other GNRs that might be associated with use of the probes is ongoing at hospitals in Texas and California. The manufacturer has issued a voluntary recall of all SLS-1 Sublingual Sensors.

Clinicians should be aware that patients exposed to these probes might have been exposed to various GNRs, including *B. cepacia*. Recovery of *B. cepacia* or GNRs that might be related to use of a sublingual carbon dioxide sensor should be reported to state health departments and CDC's Division of Healthcare Quality and Promotion, telephone 800-893-0485. Health-care facilities are encouraged to report through the voluntary MedWatch reporting program any events not reported under the mandatory process. Additional information is available at http://www.fda.gov/cdrh/mdr/index.html or telephone 800-FDA-1088. Users of this probe should return existing inventory of unused SLS-1 Sublingual Senors by contacting Nellcor's Technical Services department, telephone 800-635-5267, option 3.

Reported by: *P Metcalf, K Newman, JD Siegel, MD, Children's Medical Center, Dallas; N Pascoe, Texas Dept of Health. D Terashita, MD, L Mascola, MD, Los Angeles County Dept of Health Svcs, California. A Srinivasan, MD, M Arduino, PhD, Div of Healthcare Quality Promotion, National Center for Infectious Diseases; R Taylor, PhD, EIS Officer, CDC.*

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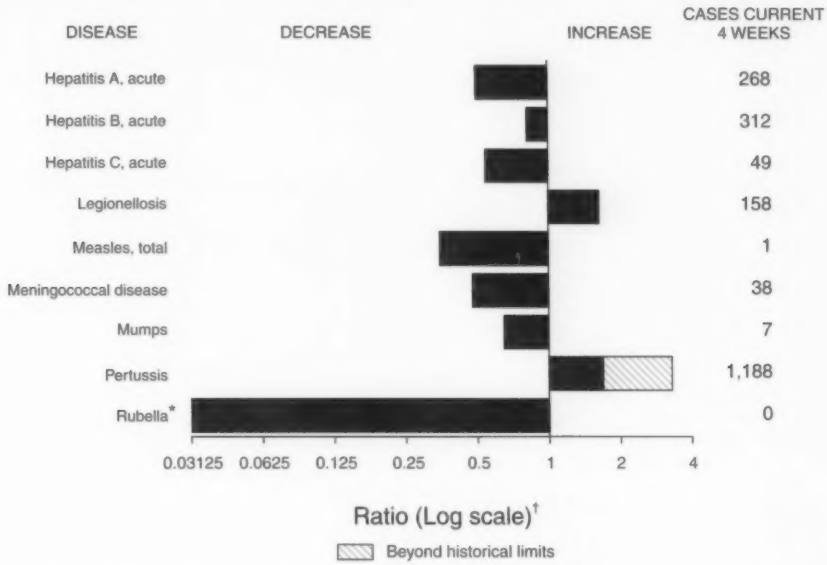
FIGURE I. Selected notifiable disease reports, United States, comparison of provisional 4-week totals August 28, 2004, with historical data



* No Rubella cases were reported for the current 4-week period yielding a ratio for week 34 of zero (0).
† Ratio of current 4-week total to mean of 15 4-week totals (from previous, comparable, and subsequent 4-week periods for the past 5 years). The point where the hatched area begins is based on the mean and two standard deviations of these 4-week totals.

TABLE I. Summary of provisional cases of selected notifiable diseases, United States, cumulative, week ending August 28, 2004 (34th Week)*

	Cum. 2004	Cum. 2003		Cum. 2004	Cum. 2003
Anthrax	-	-	Hemolytic uremic syndrome, postdiarrheal†	79	94
Botulism:	-	-	HIV infection, pediatric†¶	98	139
foodborne	8	8	Measles, total	22**	45††
infant	46	43	Mumps	132	145
other (wound & unspecified)	8	16	Plague	1	1
Brucellosis†	82	65	Poliomyelitis, paralytic	-	-
Chancroid	26	37	Psittacosis†	5	9
Cholera	3	1	Q fever†	38	52
Cyclosporiasis†	180	57	Rabies, human	5	1
Diphtheria	-	-	Rubella	15	6
Ehrlichiosis:	-	-	Rubella, congenital syndrome	-	1
human granulocytic (HGE)†	145	191	SARS-associated coronavirus disease†§§	-	8
human monocytic (HME)†	137	142	Smallpox†¶¶	-	NA
human, other and unspecified	9	27	*Staphylococcus aureus*:	-	-
Encephalitis/Meningitis:	-	-	Vancomycin-intermediate (VISA)†¶¶	4	NA
California serogroup viral†§	36	65	Vancomycin-resistant (VRSA)†¶¶	1	NA
eastern equine†§	1	11	Streptococcal toxic-shock syndrome†	68	123
Powassan†§	-	-	Tetanus	8	11
St. Louis†§	4	28	Toxic-shock syndrome	72	83
western equine†§	-	-	Trichinosis	4	-
Hansen disease (leprosy)†	53	58	Tularemia†	50	50
Hantavirus pulmonary syndrome†	15	17	Yellow fever	-	-

-: No reported cases.
* Incidence data for reporting years 2003 and 2004 are provisional and cumulative (year-to-date).
† Not notifiable in all states.
§ Updated weekly from reports to the Division of Vector-Borne Infectious Diseases, National Center for Infectious Diseases (ArboNet Surveillance).
¶ Updated monthly from reports to the Division of HIV/AIDS Prevention — Surveillance and Epidemiology, National Center for HIV, STD, and TB Prevention. Last update July 25, 2004.
** Of 22 cases reported, 10 were indigenous, and 12 were imported from another country.
†† Of 45 cases reported, 26 were indigenous, and 19 were imported from another country.
§§ Updated weekly from reports to the Division of Viral and Rickettsial Diseases, National Center for Infectious Diseases (notifiable as of July 2003).
¶¶ Not previously notifiable.

TABLE II. Provisional cases of selected notifiable diseases, United States, weeks ending August 28, 2004, and August 23, 2003 (34th Week)*

Reporting area	AIDS		Chlamydia†		Coccidiodomycosis		Cryptosporidiosis		Encephalitis/Meningitis West Nile§	
	Cum. 2004¶	Cum. 2003	Cum. 2004	Cum. 2003	Cum. 2004	Cum. 2003	Cum. 2004	Cum. 2003	Cum. 2004	Cum. 2003
UNITED STATES	23,710	26,922	566,296	555,880	3,779	2,242	1,864	1,665	389	1,556
NEW ENGLAND	775	907	19,170	17,646	-	-	96	112	-	3
Maine	10	49	1,303	1,272	N	N	15	9	-	-
N.H.	29	22	890	1,007	-	-	16	14	-	1
Vt.	13	11	663	661	-	-	16	21	-	-
Mass.	236	371	8,841	7,041	-	-	31	51	-	1
R.I.	82	68	2,187	1,770	-	-	4	12	-	-
Conn.	405	386	5,286	5,895	N	N	12	5	-	1
MID. ATLANTIC	5,023	6,202	71,060	68,893	-	-	254	222	3	48
Upstate N.Y.	625	646	14,700	12,315	N	N	66	58	-	-
N.Y. City	2,759	3,193	21,753	22,691	-	-	51	67	2	10
N.J.	923	1,045	10,654	10,301	-	-	14	11	-	6
Pa.	716	1,318	23,953	23,586	N	N	123	86	1	32
E.N. CENTRAL	1,946	2,620	95,902	99,918	10	7	556	485	15	31
Ohio	240	463	21,844	27,443	N	N	151	58	2	14
Ind.	257	346	11,784	10,971	N	N	59	47	2	7
Ill.	961	1,235	25,952	30,939	-	-	60	56	9	5
Mich.	382	452	25,212	19,478	10	7	108	73	2	3
Wis.	106	124	11,110	11,087	-	-	178	251	-	2
W.N. CENTRAL	483	490	33,869	32,272	4	2	237	199	27	338
Minn.	120	98	6,378	7,038	N	N	80	76	8	17
Iowa	37	54	3,642	3,524	N	N	50	41	-	27
Mo.	211	233	13,130	11,533	3	1	36	18	4	7
N. Dak.	13	3	971	1,021	N	N	9	10	1	51
S. Dak.	7	7	1,629	1,608	-	-	23	23	4	98
Nebr.**	18	33	3,261	2,963	1	1	21	9	-	97
Kans.	77	64	4,858	4,585	N	N	18	22	10	41
S. ATLANTIC	7,289	7,904	112,164	104,509	-	3	317	206	22	47
Del.	105	146	1,859	1,959	N	N	-	3	-	-
Md.	808	877	12,378	10,515	-	3	13	11	2	9
D.C.	460	724	2,130	2,101	-	-	8	5	-	-
Va.	403	625	14,348	12,439	-	-	38	28	1	5
W. Va.	33	53	1,837	1,674	N	N	4	3	-	-
N.C.	401	782	18,654	17,001	N	N	52	21	1	5
S.C.**	428	509	12,907	8,595	-	-	12	3	-	1
Ga.	1,034	1,205	20,703	22,918	-	-	104	74	2	8
Fla.	3,617	2,983	27,348	27,307	N	N	86	58	16	19
E.S. CENTRAL	1,179	1,143	36,847	36,264	4	1	72	80	15	42
Ky.	130	98	3,718	5,338	N	N	28	16	-	5
Tenn.**	466	517	14,649	12,951	N	N	12	29	3	6
Ala.	295	272	7,889	9,580	-	-	15	27	7	13
Miss.	288	256	10,591	8,395	4	1	17	8	5	18
W.S. CENTRAL	2,978	3,035	70,707	69,707	2	-	58	55	41	396
Ark.	130	106	5,026	5,131	1	-	14	6	1	11
La.	606	403	14,146	13,865	1	-	-	2	30	54
Okla.	120	137	7,381	7,461	N	N	14	8	2	25
Tex.**	2,122	2,389	44,154	43,250	-	-	30	39	8	306
MOUNTAIN	861	963	31,732	31,925	2,445	1,486	113	79	181	651
Mont.	5	10	1,406	1,346	N	N	31	14	1	41
Idaho	9	16	1,886	1,571	N	N	15	16	-	-
Wyo.	8	5	697	636	1	1	2	3	1	79
Colo.	166	213	7,624	8,381	N	N	38	21	23	480
N. Mex.	118	71	3,367	4,754	11	5	6	6	13	46
Ariz.	331	433	10,803	9,155	2,371	1,449	17	4	125	3
Utah	44	40	2,349	2,435	21	5	2	9	2	-
Nev.	180	175	3,600	3,647	41	26	2	6	16	2
PACIFIC	3,176	3,658	94,845	94,746	1,314	743	161	227	85	-
Wash.	215	287	11,514	10,401	N	N	17	25	-	-
Oreg.	157	166	5,240	4,857	-	-	24	26	-	-
Calif.	2,717	3,130	74,063	73,519	1,314	743	119	176	85	-
Alaska	29	13	2,388	2,479	-	-	-	-	-	-
Hawaii	58	62	1,640	3,490	-	-	1	-	-	-
Guam	2	5	-	431	-	-	-	-	-	-
P.R.	401	723	1,699	1,579	N	N	N	N	-	-
V.I.	6	22	143	252	-	-	-	-	-	-
Amer. Samoa	U	U	U	U	U	U	U	U	U	U
C.N.M.I.	2	U	32	U	-	U	-	U	-	U

N: Not notifiable. U: Unavailable. -: No reported cases. C.N.M.I.: Commonwealth of Northern Mariana Islands.

* Incidence data for reporting years 2003 and 2004 are provisional and cumulative (year-to-date).

† Chlamydia refers to genital infections caused by *C. trachomatis*.

§ Updated weekly from reports to the Division of Vector-Borne Infectious Diseases, National Center for Infectious Diseases (ArboNet Surveillance).

¶ Updated monthly from reports to the Division of HIV/AIDS Prevention — Surveillance and Epidemiology, National Center for HIV, STD, and TB Prevention. Last update July 25, 2004.

** Contains data reported through National Electronic Disease Surveillance System (NEDSS).

TABLE II. (*Continued*) Provisional cases of selected notifiable diseases, United States, weeks ending August 28, 2004, and August 23, 2003 (34th Week)*

Reporting area	*Escherichia coli*, Enterohemorrhagic (EHEC)						Giardiasis		Gonorrhea	
	O157:H7		Shiga toxin positive, serogroup non-O157		Shiga toxin positive, not serogrouped					
	Cum. 2004	Cum. 2003	Cum. 2004	Cum. 2003	Cum. 2004	Cum. 2003	Cum. 2004	Cum. 2003	Cum. 2004	Cum. 2003
UNITED STATES	1,427	1,331	191	154	101	89	10,454	11,149	198,473	210,768
NEW ENGLAND	88	92	31	29	19	10	850	844	4,521	4,509
Maine	5	6	-	-	-	-	73	106	154	130
N.H.	10	13	5	3	-	-	18	26	64	73
Vt.	8	11	-	-	1	-	99	65	56	54
Mass.	39	36	6	7	18	10	408	415	2,084	1,759
R.I.	6	1	1	-	-	-	68	74	562	610
Conn.	20	25	19	19	-	-	184	158	1,601	1,883
MID. ATLANTIC	149	156	21	16	17	18	2,265	2,279	22,605	26,405
Upstate N.Y.	69	55	11	8	7	7	803	600	4,804	4,799
N.Y. City	26	6	-	-	-	-	605	744	6,892	8,731
N.J.	22	21	3	2	4	-	231	325	4,031	5,446
Pa.	32	74	7	6	6	11	626	610	6,878	7,429
E.N. CENTRAL	269	295	24	24	13	11	1,496	1,954	39,327	44,213
Ohio	63	51	8	12	11	11	516	529	10,901	14,283
Ind.	35	53	-	-	-	-	-	-	4,198	4,158
Ill.	44	56	1	2	-	-	312	601	11,312	13,706
Mich.	54	46	5	-	2	-	434	448	10,068	8,358
Wis.	73	89	10	10	-	-	234	376	2,848	3,708
W.N. CENTRAL	329	220	21	28	16	15	1,195	1,124	10,715	11,124
Minn.	76	69	10	14	2	1	438	429	2,055	1,876
Iowa	91	48	-	-	-	-	179	149	649	862
Mo.	55	52	11	7	6	1	291	310	5,481	5,556
N. Dak.	12	7	-	3	6	5	18	28	72	51
S. Dak.	26	13	-	3	-	-	40	28	174	130
Nebr.	49	15	-	1	-	-	89	74	644	954
Kans.	20	16	-	-	2	8	140	106	1,640	1,695
S. ATLANTIC	111	93	22	31	26	21	1,687	1,660	50,586	51,802
Del.	2	5	N	N	N	N	32	24	586	767
Md.	20	6	3	2	2	1	76	70	5,276	5,016
D.C.	1	1	-	-	-	-	37	28	1,587	1,594
Va.	25	25	9	5	-	-	312	222	5,816	5,846
W. Va.	2	3	-	-	-	-	22	25	598	558
N.C.	-	-	-	-	16	17	N	N	9,890	9,717
S.C.	6	-	-	-	-	-	33	76	6,286	4,989
Ga.	17	20	6	5	-	-	457	537	8,977	11,307
Fla.	38	33	4	19	8	3	718	678	11,570	12,008
E.S. CENTRAL	52	52	1	1	8	5	179	216	15,902	17,790
Ky.	19	17	1	1	5	5	N	N	1,623	2,314
Tenn.	15	22	-	-	3	-	82	101	5,402	5,292
Ala.	11	10	-	-	-	-	97	115	4,810	5,995
Miss.	7	3	-	-	-	-	-	-	4,067	4,189
W.S. CENTRAL	67	55	57	4	2	4	179	186	26,701	28,665
Ark.	10	6	1	-	-	-	73	100	2,433	2,714
La.	2	3	-	-	-	-	19	8	6,462	7,807
Okla.	13	16	-	-	-	-	84	78	3,128	2,964
Tex.	42	30	56	4	2	4	3	-	14,678	15,180
MOUNTAIN	141	170	13	19	-	5	944	917	6,826	6,794
Mont.	12	10	-	-	-	-	39	58	41	71
Idaho	32	37	6	14	-	-	110	110	55	46
Wyo.	4	2	1	-	-	-	15	14	39	30
Colo.	37	45	2	3	-	5	335	269	1,735	1,876
N. Mex.	7	6	1	2	-	-	48	33	435	786
Ariz.	14	22	N	N	N	N	127	149	2,569	2,523
Utah	25	31	2	-	-	-	193	202	354	228
Nev.	10	17	1	-	-	-	77	82	1,598	1,234
PACIFIC	221	198	1	2	-	-	1,659	1,969	21,290	19,466
Wash.	80	48	-	1	-	-	216	181	1,705	1,758
Oreg.	41	49	1	1	-	-	281	254	683	641
Calif.	91	96	-	-	-	-	1,067	1,425	18,118	15,962
Alaska	1	1	-	-	-	-	44	53	383	349
Hawaii	8	4	-	-	-	-	51	56	401	756
Guam	N	N	-	-	-	-	-	2	-	44
P.R.	-	1	-	-	-	-	35	163	135	178
V.I.	-	-	-	-	-	-	-	-	49	58
Amer. Samoa	U	U	U	U	U	U	U	U	U	U
C.N.M.I.	-	U	-	U	-	U	-	U	3	U

N: Not notifiable. U: Unavailable. - : No reported cases.
* Incidence data for reporting years 2003 and 2004 are provisional and cumulative (year-to-date).

TABLE II. (*Continued*) Provisional cases of selected notifiable diseases, United States, weeks ending August 28, 2004, and August 23, 2003 (34th Week)*

Reporting area	*Haemophilus influenzae*, invasive								Hepatitis (viral, acute), by type	
	All ages		Age <5 years						A	
	All serotypes		Serotype b		Non-serotype b		Unknown serotype			
	Cum. 2004	Cum. 2003	Cum. 2004	Cum. 2003	Cum. 2004	Cum. 2003	Cum. 2004	Cum. 2003	Cum. 2004	Cum. 2003
UNITED STATES	1,233	1,267	10	19	64	83	121	137	3,621	4,100
NEW ENGLAND	104	91	1	2	5	5	3	3	621	195
Maine	9	2	-	-	-	-	-	1	10	8
N.H.	13	10	-	1	2	-	-	-	11	9
Vt.	5	6	-	-	-	-	1	-	8	5
Mass.	45	44	1	1	-	5	2	1	522	109
R.I.	3	4	-	-	-	-	-	1	17	11
Conn.	29	25	-	-	3	-	-	-	53	53
MID. ATLANTIC	263	272	-	1	3	2	29	32	416	861
Upstate N.Y.	88	99	-	1	3	2	5	7	56	77
N.Y. City	54	47	-	-	-	-	9	8	161	319
N.J.	53	53	-	-	-	-	3	7	83	132
Pa.	68	73	-	-	-	-	12	10	116	333
E.N. CENTRAL	198	208	-	3	6	3	28	38	341	406
Ohio	74	51	-	-	2	-	12	8	35	76
Ind.	37	34	-	-	4	-	1	3	61	44
Ill.	45	79	-	-	-	-	9	20	120	118
Mich.	14	16	-	3	-	3	5	1	102	131
Wis.	28	28	-	-	-	-	1	6	23	37
W.N. CENTRAL	75	84	2	-	3	6	6	11	133	114
Minn.	34	34	1	-	3	6	-	2	28	33
Iowa	1	-	1	-	-	-	-	-	36	17
Mo.	23	34	-	-	-	-	3	9	40	37
N. Dak.	3	2	-	-	-	-	-	-	1	-
S. Dak.	-	1	-	-	-	-	-	-	3	-
Nebr.	7	1	-	-	-	-	1	-	8	9
Kans.	7	12	-	-	-	-	2	-	17	18
S. ATLANTIC	287	271	-	1	16	10	21	16	690	888
Del.	-	-	-	-	-	-	-	-	5	5
Md.	44	64	-	-	4	5	-	-	83	90
D.C.	-	-	-	-	-	-	-	-	4	27
Va.	28	39	-	-	-	-	1	5	76	52
W. Va.	11	13	-	-	-	-	3	-	4	12
N.C.	41	23	-	-	5	2	1	1	70	46
S.C.	4	5	-	-	-	-	-	1	22	25
Ga.	80	49	-	-	-	-	14	6	231	372
Fla.	79	78	-	1	7	3	2	3	195	259
E.S. CENTRAL	44	50	1	1	-	2	8	4	105	115
Ky.	4	4	-	-	-	1	-	-	25	23
Tenn.	27	29	-	-	-	1	6	3	54	65
Ala.	12	16	1	1	-	-	2	1	6	13
Miss.	1	1	-	-	-	-	-	-	20	14
W.S. CENTRAL	51	57	1	2	6	9	1	4	326	420
Ark.	2	5	-	-	-	1	-	-	53	22
La.	8	17	-	-	-	2	1	4	15	34
Okla.	40	32	-	-	6	6	-	-	18	9
Tex.	1	3	1	2	-	-	-	-	240	355
MOUNTAIN	147	127	3	6	18	22	18	13	315	316
Mont.	-	-	-	-	-	-	-	-	4	7
Idaho	5	3	-	-	-	-	2	1	13	11
Wyo.	-	1	-	-	-	-	-	-	4	1
Colo.	35	24	-	-	-	-	4	5	37	48
N. Mex.	29	15	-	-	5	4	5	1	13	16
Ariz.	55	64	-	6	9	9	2	4	197	173
Utah	12	10	2	-	1	5	4	2	36	23
Nev.	11	10	1	-	3	4	1	-	11	37
PACIFIC	64	107	2	3	7	24	7	16	674	785
Wash.	3	7	2	-	-	5	1	1	40	41
Oreg.	32	26	-	-	-	-	2	2	46	42
Calif.	18	48	-	3	7	19	2	8	566	687
Alaska	4	18	-	-	-	-	1	5	5	7
Hawaii	7	8	-	-	-	-	1	-	17	8
Guam	-	-	-	-	-	-	-	-	-	2
P.R.	-	-	-	-	-	-	-	-	15	55
V.I.	-	-	-	-	-	-	-	-	-	-
Amer. Samoa	U	U	U	U	U	U	U	U	U	U
C.N.M.I.	-	U	-	U	-	U	-	U	-	U

N: Not notifiable. U: Unavailable. -: No reported cases.

* Incidence data for reporting years 2003 and 2004 are provisional and cumulative (year-to-date).

TABLE II. (*Continued*) Provisional cases of selected notifiable diseases, United States, weeks ending August 28, 2004, and August 23, 2003 (34th Week)*

Reporting area	Hepatitis (viral, acute), by type				Legionellosis		Listeriosis		Lyme disease	
	B		C							
	Cum. 2004	Cum. 2003	Cum. 2004	Cum. 2003	Cum. 2004	Cum. 2003	Cum. 2004	Cum. 2003	Cum. 2004	Cum. 2003
UNITED STATES	4,031	4,510	697	688	1,079	1,246	388	418	9,790	13,245
NEW ENGLAND	214	228	5	4	23	64	17	31	1,054	2,548
Maine	1	1	-	-	-	1	5	5	53	87
N.H.	23	11	-	-	1	6	1	3	52	83
Vt.	3	3	2	4	3	3	1	-	31	23
Mass.	116	150	3	-	4	39	3	14	207	1,242
R.I.	3	8	-	-	2	3	1	-	148	286
Conn.	68	55	U	U	13	12	6	9	563	827
MID. ATLANTIC	757	513	87	82	278	337	90	84	7,004	8,755
Upstate N.Y.	58	52	9	10	54	78	28	15	2,374	2,481
N.Y. City	68	147	-	-	20	38	12	15	-	171
N.J.	437	129	-	-	50	54	16	18	1,843	2,300
Pa.	194	185	78	72	154	167	34	36	2,787	3,803
E.N. CENTRAL	363	322	67	102	277	262	68	57	472	729
Ohio	86	91	5	7	125	146	32	17	57	32
Ind.	30	23	4	6	50	17	15	4	60	15
Ill.	50	38	10	16	10	33	-	16	-	59
Mich.	174	139	48	68	85	51	19	14	18	3
Wis.	23	31	-	5	7	15	2	6	337	620
W.N. CENTRAL	241	211	182	143	26	46	7	12	274	212
Minn.	32	28	12	7	3	3	3	3	197	147
Iowa	13	7	-	1	3	9	1	-	19	29
Mo.	159	142	170	133	12	22	2	5	49	31
N. Dak.	4	2	-	-	2	1	-	-	-	-
S. Dak.	-	2	-	-	3	1	-	-	-	-
Nebr.	20	17	-	2	1	2	1	3	6	2
Kans.	13	13	-	-	2	8	-	1	3	3
S. ATLANTIC	1,251	1,259	117	107	240	323	65	80	828	815
Del.	25	6	-	-	8	13	N	N	97	152
Md.	103	79	13	6	51	78	9	13	481	508
D.C.	13	7	1	-	5	9	-	-	3	5
Va.	158	111	15	6	31	60	13	9	94	50
W. Va.	26	20	18	1	5	12	2	5	13	11
N.C.	129	110	8	8	25	25	15	11	80	56
S.C.	55	94	7	24	1	5	-	2	8	1
Ga.	408	419	9	9	30	23	10	20	9	10
Fla.	334	413	46	53	84	98	16	20	43	22
E.S. CENTRAL	260	289	63	50	51	80	16	16	28	42
Ky.	40	47	22	9	22	31	4	4	12	9
Tenn.	108	116	20	11	17	27	7	4	9	12
Ala.	42	64	2	5	11	18	3	6	1	6
Miss.	70	62	19	25	1	4	2	2	6	15
W.S. CENTRAL	163	738	86	123	81	46	30	38	45	79
Ark.	51	55	2	3	-	2	2	1	4	-
La.	34	92	44	78	3	1	2	2	2	6
Okla.	29	42	3	2	3	5	-	1	-	-
Tex.	49	549	37	40	75	38	26	34	39	73
MOUNTAIN	339	383	39	32	56	43	15	24	20	9
Mont.	2	13	2	1	1	2	-	1	-	-
Idaho	9	6	-	1	7	3	1	2	5	2
Wyo.	7	23	2	-	5	2	-	-	2	1
Colo.	37	54	8	7	12	8	6	9	1	-
N. Mex.	10	29	7	-	1	2	-	2	-	1
Ariz.	192	170	5	6	10	9	-	6	5	-
Utah	32	33	3	-	16	13	1	2	7	2
Nev.	50	55	12	17	4	4	7	2	-	3
PACIFIC	443	567	51	45	47	45	80	76	65	56
Wash.	38	43	15	15	9	5	8	4	9	1
Oreg.	76	78	11	7	N	N	5	3	25	10
Calif.	312	426	22	21	38	40	64	65	30	42
Alaska	14	4	-	-	-	-	-	-	1	3
Hawaii	3	16	3	2	-	-	3	4	N	N
Guam	-	5	-	3	-	-	-	-	-	-
P.R.	38	90	-	-	1	-	-	-	N	N
V.I.	-	-	-	-	-	-	-	-	-	-
Amer. Samoa	U	U	U	U	U	U	U	U	U	U
C.N.M.I.	-	U	-	U	-	U	-	U	-	U

N: Not notifiable. U: Unavailable. -: No reported cases.
* Incidence data for reporting years 2003 and 2004 are provisional and cumulative (year-to-date).

TABLE II. (*Continued*) Provisional cases of selected notifiable diseases, United States, weeks ending August 28, 2004, and August 23, 2003 (34th Week)*

Reporting area	Malaria		Meningococcal disease		Pertussis		Rabies, animal		Rocky Mountain spotted fever	
	Cum. 2004	Cum. 2003	Cum. 2004	Cum. 2003	Cum. 2004	Cum. 2003	Cum. 2004	Cum. 2003	Cum. 2004	Cum. 2003
UNITED STATES	820	762	940	1,172	8,230	5,037	3,489	4,630	776	457
NEW ENGLAND	48	35	49	51	846	621	368	354	14	7
Maine	5	2	6	5	2	12	32	34	-	-
N.H.	1	5	3	3	26	55	11	16	-	-
Vt.	3	1	2	-	50	50	16	22	-	-
Mass.	24	14	29	32	740	472	155	128	12	7
R.I.	2	1	1	2	16	7	24	46	1	-
Conn.	13	12	6	9	12	25	130	108	1	-
MID. ATLANTIC	184	193	115	140	1,737	524	345	584	46	29
Upstate N.Y.	29	35	28	32	1,233	222	312	244	1	-
N.Y. City	77	95	21	33	92	75	4	5	7	9
N.J.	39	41	25	19	144	86	-	62	15	13
Pa.	39	22	41	56	268	141	29	273	23	7
E.N. CENTRAL	68	72	133	187	1,959	475	93	99	42	9
Ohio	22	13	52	45	354	149	45	38	14	4
Ind.	8	2	20	34	63	37	7	11	24	1
Ill.	13	32	12	50	315	47	29	13	-	2
Mich.	15	19	39	33	99	63	12	31	4	2
Wis.	10	6	10	25	1,128	179	-	6	-	-
W.N. CENTRAL	46	32	66	85	1,021	210	333	476	76	45
Minn.	18	18	18	20	153	59	55	24	-	1
Iowa	2	3	12	16	44	55	63	71	-	2
Mo.	14	3	19	34	201	56	26	14	62	36
N. Dak.	3	1	2	1	566	3	47	42	-	-
S. Dak.	1	2	2	1	11	3	10	105	4	3
Nebr.	2	-	3	6	4	5	53	86	10	2
Kans.	6	5	10	7	42	29	79	134	-	1
S. ATLANTIC	211	190	155	213	393	398	1,243	1,851	346	250
Del.	4	2	2	8	7	7	9	26	-	1
Md.	41	44	8	24	81	58	157	254	40	67
D.C.	9	8	4	4	2	-	-	-	-	-
Va.	32	22	12	19	105	64	326	369	17	14
W. Va.	-	4	5	4	10	6	43	62	4	5
N.C.	14	13	24	27	62	86	422	544	238	97
S.C.	7	3	11	19	33	80	98	158	10	12
Ga.	40	45	10	24	11	25	184	250	21	47
Fla.	64	49	79	84	82	72	4	188	16	7
E.S. CENTRAL	22	17	39	57	108	111	92	142	78	74
Ky.	4	3	8	13	40	36	18	29	1	-
Tenn.	3	4	10	14	37	52	29	89	31	42
Ala.	11	6	10	15	20	15	36	23	22	12
Miss.	4	4	11	15	11	8	9	1	24	20
W.S. CENTRAL	110	90	112	134	376	396	776	855	152	36
Ark.	7	4	14	11	32	35	35	25	78	-
La.	2	3	23	33	7	7	-	2	3	-
Okla.	7	4	7	13	17	45	84	148	70	27
Tex.	94	79	68	77	320	309	657	680	1	9
MOUNTAIN	32	24	46	63	788	664	124	119	17	7
Mont.	-	-	3	3	32	2	19	16	3	1
Idaho	1	1	6	6	24	54	2	9	3	2
Wyo.	-	1	2	2	14	122	2	3	2	2
Colo.	12	12	12	17	398	229	29	23	1	2
N. Mex.	2	1	6	8	90	50	3	5	2	-
Ariz.	8	5	10	21	143	114	61	51	1	-
Utah	5	3	4	-	75	70	5	8	5	-
Nev.	4	1	3	6	12	23	3	4	-	-
PACIFIC	99	109	225	242	1,002	1,638	115	150	5	-
Wash.	12	16	23	24	452	416	-	-	-	-
Oreg.	13	9	46	36	295	340	5	5	3	-
Calif.	72	80	150	168	236	872	102	138	2	-
Alaska	-	-	2	4	8	1	8	7	-	-
Hawaii	2	4	4	10	11	9	-	-	-	-
Guam	-	1	-	-	-	1	-	-	-	-
P.R.	-	-	5	8	3	2	40	49	N	N
V.I.	-	-	-	-	-	-	-	-	-	-
Amer. Samoa	U	U	U	U	U	U	U	U	U	U
C.N.M.I.	-	U	-	U	-	U	-	U	-	U

N: Not notifiable. U: Unavailable. - : No reported cases.
* Incidence data for reporting years 2003 and 2004 are provisional and cumulative (year-to-date).

TABLE II. (*Continued*) Provisional cases of selected notifiable diseases, United States, weeks ending August 28, 2004, and August 23, 2003 (34th Week)*

Reporting area	Salmonellosis		Shigellosis		Streptococcal disease, invasive, group A		*Streptococcus pneumoniae*, invasive			
							Drug resistant, all ages		Age <5 years	
	Cum. 2004	Cum. 2003	Cum. 2004	Cum. 2003	Cum. 2004	Cum. 2003	Cum. 2004	Cum. 2003	Cum. 2004	Cum. 2003
UNITED STATES	24,276	25,590	7,348	15,097	3,301	4,256	1,461	1,432	467	489
NEW ENGLAND	1,214	1,364	161	201	141	379	22	73	51	6
Maine	60	89	2	6	6	23	2	-	3	-
N.H.	51	97	5	5	15	24	-	-	N	N
Vt.	37	46	2	6	8	17	7	6	1	3
Mass.	720	820	98	142	95	169	N	N	40	N
R.I.	75	60	13	6	17	9	13	10	7	3
Conn.	271	252	41	36	-	137	-	57	U	U
MID. ATLANTIC	3,476	3,010	764	1,624	549	734	105	94	79	74
Upstate N.Y.	778	640	333	237	183	277	48	51	54	54
N.Y. City	741	829	217	263	73	103	U	U	U	U
N.J.	509	530	141	272	129	142	-	-	5	2
Pa.	1,448	1,011	73	852	164	212	57	43	20	18
E.N. CENTRAL	3,347	3,668	632	1,296	655	1,036	350	325	114	212
Ohio	875	917	114	238	176	244	243	213	59	76
Ind.	383	364	136	102	79	101	107	112	25	21
Ill.	992	1,306	229	689	135	261	-	-	-	79
Mich.	568	506	76	179	228	299	N	N	N	N
Wis.	529	575	77	88	37	131	N	N	30	36
W.N. CENTRAL	1,556	1,483	277	491	220	256	13	11	66	54
Minn.	377	329	35	63	112	122	-	-	48	38
Iowa	323	233	56	37	N	N	N	N	N	N
Mo.	404	545	113	263	44	58	8	7	8	2
N. Dak.	29	27	2	6	10	13	-	3	2	4
S. Dak.	72	63	9	9	12	19	5	1	-	-
Nebr.	101	97	16	67	11	22	-	-	5	5
Kans.	250	189	46	46	31	22	N	N	3	5
S. ATLANTIC	6,295	5,912	1,766	4,641	639	710	748	759	35	14
Del.	55	64	6	152	3	6	4	1	N	N
Md.	552	493	90	436	132	175	-	10	24	-
D.C.	28	21	24	47	4	6	4	-	3	5
Va.	770	615	103	282	60	87	N	N	N	N
W. Va.	144	80	4	-	18	30	84	54	8	9
N.C.	829	700	201	596	85	80	N	N	U	U
S.C.	489	336	212	308	35	35	65	111	N	N
Ga.	1,031	1,139	401	881	137	140	169	163	N	N
Fla.	2,397	2,464	725	1,939	165	151	422	420	N	N
E.S. CENTRAL	1,392	1,705	401	629	146	147	87	104	1	-
Ky.	227	263	48	68	50	39	21	14	N	N
Tenn.	246	474	145	224	96	108	65	90	N	N
Ala.	399	405	169	201	-	-	-	-	N	N
Miss.	520	563	39	136	-	-	1	-	1	-
W.S. CENTRAL	2,164	3,867	1,893	3,914	230	197	36	58	87	75
Ark.	320	423	48	73	15	6	6	19	7	5
La.	274	541	170	301	2	1	30	39	12	15
Okla.	257	268	318	562	47	65	N	N	32	36
Tex.	1,313	2,635	1,357	2,978	166	125	N	N	36	19
MOUNTAIN	1,539	1,356	497	661	362	357	25	4	34	54
Mont.	109	66	4	2	-	1	-	-	-	-
Idaho	115	119	9	23	8	15	N	N	N	N
Wyo.	35	65	3	5	6	2	6	3	-	-
Colo.	387	328	100	135	93	100	-	-	31	42
N. Mex.	156	143	70	136	62	88	5	-	-	8
Ariz.	484	394	260	296	159	127	N	N	N	N
Utah	144	130	28	32	32	23	12	1	3	4
Nev.	109	111	23	32	2	1	2	-	-	-
PACIFIC	3,293	3,225	957	1,640	359	440	75	4	-	-
Wash.	346	361	75	117	38	41	-	-	N	N
Oreg.	270	275	47	178	N	N	N	N	N	N
Calif.	2,420	2,406	800	1,311	259	317	N	N	N	N
Alaska	39	53	5	5	-	-	-	-	N	N
Hawaii	218	130	30	29	62	82	75	4	-	-
Guam	-	35	-	28	-	-	-	-	-	-
P.R.	128	435	4	16	N	N	N	N	N	N
V.I.	-	-	-	-	-	-	-	-	-	-
Amer. Samoa	U	U	U	U	U	U	U	U	U	U
C.N.M.I.	3	U	-	U	-	U	-	U	-	U

N: Not notifiable. U: Unavailable. - : No reported cases.
* Incidence data for reporting years 2003 and 2004 are provisional and cumulative (year-to-date).

TABLE II. (*Continued*) Provisional cases of selected notifiable diseases, United States, weeks ending August 28, 2004, and August 23, 2003 (34th Week)*

Reporting area	Syphilis: Primary & secondary Cum. 2004	Syphilis: Primary & secondary Cum. 2003	Syphilis: Congenital Cum. 2004	Syphilis: Congenital Cum. 2003	Tuberculosis Cum. 2004	Tuberculosis Cum. 2003	Typhoid fever Cum. 2004	Typhoid fever Cum. 2003	Varicella (Chickenpox) Cum. 2004	Varicella (Chickenpox) Cum. 2003
UNITED STATES	4,711	4,564	217	293	6,368	8,183	192	225	12,678	10,878
NEW ENGLAND	126	139	1	-	209	269	16	20	590	2,199
Maine	2	6	-	-	-	17	-	-	179	641
N.H.	3	15	-	-	9	10	-	2	-	-
Vt.	-	-	-	-	-	7	-	-	411	492
Mass.	82	89	-	-	133	133	13	11	-	116
R.I.	17	14	-	-	19	34	1	2	-	3
Conn.	22	15	1	-	48	68	2	5	-	947
MID. ATLANTIC	636	555	36	44	1,329	1,407	35	41	66	23
Upstate N.Y.	65	26	6	7	175	173	6	7	-	-
N.Y. City	381	309	9	24	677	738	11	22	-	-
N.J.	103	112	20	13	265	272	9	11	-	-
Pa.	87	108	1	-	212	224	9	1	66	23
E.N. CENTRAL	534	618	36	48	769	755	13	27	3,956	3,804
Ohio	146	136	1	2	129	135	4	1	1,025	933
Ind.	44	33	9	9	84	88	-	4	-	-
Ill.	197	249	4	18	341	346	-	15	-	-
Mich.	127	186	22	19	155	143	8	7	2,539	2,274
Wis.	20	14	-	-	60	43	1	-	392	597
W.N. CENTRAL	108	104	3	4	281	297	8	4	123	40
Minn.	14	33	1	-	109	116	4	2	-	-
Iowa	5	7	-	-	23	19	-	1	N	N
Mo.	66	36	1	4	71	76	2	1	5	-
N. Dak.	-	2	-	-	3	-	-	-	75	40
S. Dak.	-	1	-	-	8	16	-	-	43	-
Nebr.	5	5	-	-	22	12	2	-	-	-
Kans.	18	20	1	-	45	58	-	-	-	-
S. ATLANTIC	1,234	1,206	30	57	1,261	1,574	36	36	1,592	1,567
Del.	6	4	1	-	-	-	-	-	4	21
Md.	235	197	3	10	172	148	9	8	-	-
D.C.	53	34	1	-	54	-	1	-	17	22
Va.	70	62	2	1	140	166	3	11	395	432
W. Va.	2	2	-	-	14	12	-	-	947	918
N.C.	121	106	6	13	169	194	3	6	N	N
S.C.	84	74	6	4	118	103	-	-	229	174
Ga.	184	324	1	13	11	340	13	5	-	-
Fla.	479	403	10	16	583	611	7	6	-	-
E.S. CENTRAL	264	209	16	11	378	444	5	5	-	-
Ky.	27	29	1	1	68	79	2	-	-	-
Tenn.	89	86	7	2	144	156	3	2	-	-
Ala.	119	74	6	6	133	139	-	3	-	-
Miss.	29	20	2	2	33	70	-	-	-	-
W.S. CENTRAL	759	568	35	53	475	1,245	26	22	4,703	2,858
Ark.	32	36	-	1	76	64	-	-	-	-
La.	151	84	-	1	-	-	-	-	42	10
Okla.	19	40	2	1	97	99	1	-	-	-
Tex.	557	408	33	50	302	1,082	25	22	4,661	2,848
MOUNTAIN	229	209	37	27	301	267	5	4	1,648	387
Mont.	-	-	-	-	4	5	-	-	-	-
Idaho	13	4	2	2	4	5	-	-	-	-
Wyo.	1	-	-	-	2	3	-	-	26	39
Colo.	25	23	-	3	64	63	1	3	1,248	-
N. Mex.	32	38	1	4	16	31	-	-	68	-
Ariz.	135	130	34	18	130	114	2	1	-	-
Utah	4	5	-	-	28	24	1	-	306	348
Nev.	19	9	-	-	53	22	1	-	-	-
PACIFIC	821	956	23	49	1,365	1,925	48	66	-	-
Wash.	76	50	-	-	145	161	4	2	-	-
Oreg.	19	29	-	-	55	72	2	3	-	-
Calif.	723	870	23	49	1,072	1,578	36	60	-	-
Alaska	-	1	-	-	23	42	-	-	-	-
Hawaii	3	6	-	-	70	72	6	1	-	-
Guam	-	1	-	-	-	38	-	-	-	94
P.R.	77	126	5	10	60	58	-	-	190	407
V.I.	4	1	-	-	-	-	-	-	-	-
Amer. Samoa	U	U	U	U	U	U	U	U	U	U
C.N.M.I.	2	U	-	U	10	U	-	U	-	U

N: Not notifiable. U: Unavailable. - : No reported cases.
* Incidence data for reporting years 2003 and 2004 are provisional and cumulative (year-to-date).

TABLE III. Deaths in 122 U.S. cities,* week ending August 28, 2004 (34th Week)

Reporting Area	All causes, by age (years)						P&I† Total
	All Ages	≥65	45–64	25–44	1–24	<1	
NEW ENGLAND	499	358	75	36	17	13	45
Boston, Mass.	134	93	26	7	3	5	11
Bridgeport, Conn.	22	17	2	2	1	-	3
Cambridge, Mass.	20	16	4	-	-	-	2
Fall River, Mass.	19	17	2	-	-	-	4
Hartford, Conn.	38	28	3	5	2	-	5
Lowell, Mass.	27	23	3	1	-	-	2
Lynn, Mass.	3	2	1	-	-	-	-
New Bedford, Mass.	18	12	4	2	-	-	1
New Haven, Conn.	44	23	7	3	4	7	4
Providence, R.I.	51	33	8	7	3	-	5
Somerville, Mass.	4	4	-	-	-	-	-
Springfield, Mass.	33	24	5	2	1	1	2
Waterbury, Conn.	30	24	3	3	-	-	1
Worcester, Mass.	56	42	7	4	3	-	5
MID. ATLANTIC	2,094	1,403	457	131	55	46	103
Albany, N.Y.	51	37	6	5	2	1	5
Allentown, Pa.	25	24	1	-	-	-	2
Buffalo, N.Y.	77	51	22	3	-	1	3
Camden, N.J.	22	12	7	2	1	-	1
Elizabeth, N.J.	16	12	3	1	-	-	-
Erie, Pa.	32	24	8	-	-	-	2
Jersey City, N.J.	44	33	10	1	-	-	-
New York City, N.Y.	970	662	214	55	22	15	40
Newark, N.J.	40	15	16	5	3	1	2
Paterson, N.J.	11	5	4	2	-	-	-
Philadelphia, Pa.	428	255	97	39	22	15	23
Pittsburgh, Pa.§	35	22	5	1	1	6	2
Reading, Pa.	28	17	9	-	1	1	2
Rochester, N.Y.	122	92	19	9	1	1	7
Schenectady, N.Y.	16	10	5	1	-	-	3
Scranton, Pa.	17	12	5	-	-	-	-
Syracuse, N.Y.	103	75	18	4	1	5	8
Trenton, N.J.	14	12	1	1	-	-	-
Utica, N.Y.	20	16	3	1	-	-	2
Yonkers, N.Y.	23	17	4	1	1	-	1
E.N. CENTRAL	2,002	1,274	494	123	56	55	129
Akron, Ohio	47	32	11	2	1	1	6
Canton, Ohio	34	23	8	3	-	-	1
Chicago, Ill.	338	194	95	27	12	10	24
Cincinnati, Ohio	60	41	11	2	1	5	2
Cleveland, Ohio	222	146	56	10	3	7	7
Columbus, Ohio	186	124	45	10	4	3	13
Dayton, Ohio	113	77	28	6	1	1	10
Detroit, Mich.	172	84	61	14	6	7	12
Evansville, Ind.	57	44	11	-	1	1	1
Fort Wayne, Ind.	62	44	16	1	-	1	5
Gary, Ind.	20	8	7	2	3	-	-
Grand Rapids, Mich.	53	38	10	4	1	-	8
Indianapolis, Ind.	214	132	44	20	11	7	11
Lansing, Mich.	48	32	10	1	3	2	4
Milwaukee, Wis.	92	58	22	7	-	5	10
Peoria, Ill.	57	42	8	6	-	1	1
Rockford, Ill.	51	32	15	3	-	1	2
South Bend, Ind.	35	22	11	-	1	1	1
Toledo, Ohio	79	52	18	3	4	2	6
Youngstown, Ohio	62	49	7	2	4	-	5
W.N. CENTRAL	659	441	124	51	32	11	49
Des Moines, Iowa	76	57	13	4	2	-	8
Duluth, Minn.	19	14	3	1	1	-	2
Kansas City, Kans.	53	37	7	6	2	1	4
Kansas City, Mo.	58	39	5	7	4	3	3
Lincoln, Nebr.	33	24	6	2	1	-	-
Minneapolis, Minn.	54	35	12	4	2	1	4
Omaha, Nebr.	77	60	12	2	3	-	8
St. Louis, Mo.	111	61	24	16	8	2	8
St. Paul, Minn.	59	33	13	5	5	3	3
Wichita, Kans.	119	81	29	4	4	1	9
S. ATLANTIC	1,035	679	217	89	38	10	45
Atlanta, Ga.	78	41	24	9	4	-	1
Baltimore, Md.	150	96	26	16	7	5	10
Charlotte, N.C.	103	70	16	7	9	-	7
Jacksonville, Fla.	136	83	35	12	4	1	5
Miami, Fla.	123	90	21	9	3	-	4
Norfolk, Va.	37	23	11	1	1	1	2
Richmond, Va.	45	29	12	3	1	-	2
Savannah, Ga.	43	25	11	5	2	-	2
St. Petersburg, Fla.	52	34	12	4	1	1	5
Tampa, Fla.	163	124	24	13	2	-	7
Washington, D.C.	100	62	24	8	4	2	-
Wilmington, Del.	5	2	1	2	-	-	-
E.S. CENTRAL	885	564	213	62	32	22	50
Birmingham, Ala.	228	148	53	17	6	4	13
Chattanooga, Tenn.	86	62	17	4	1	2	9
Knoxville, Tenn.	77	50	17	4	1	5	2
Lexington, Ky.	58	31	14	10	3	-	2
Memphis, Tenn.	144	92	36	10	3	3	15
Mobile, Ala.	91	66	18	4	2	1	2
Montgomery, Ala.	66	39	18	2	2	5	1
Nashville, Tenn.	135	76	40	11	4	2	6
W.S. CENTRAL	1,600	1,017	352	137	58	36	80
Austin, Tex.	96	58	24	10	1	3	4
Baton Rouge, La.	45	30	7	5	3	-	-
Corpus Christi, Tex.	58	35	15	5	1	2	5
Dallas, Tex.	193	116	45	20	9	3	14
El Paso, Tex.	95	58	25	5	5	2	6
Ft. Worth, Tex.	125	92	21	9	3	-	8
Houston, Tex.	358	221	82	29	17	9	16
Little Rock, Ark.	75	51	13	6	1	4	1
New Orleans, La.	62	23	19	12	7	1	-
San Antonio, Tex.	259	173	58	19	5	4	18
Shreveport, La.	103	73	21	4	3	2	5
Tulsa, Okla.	131	87	22	13	3	6	3
MOUNTAIN	941	636	192	66	26	21	51
Albuquerque, N.M.	108	74	23	6	3	2	5
Boise, Idaho	40	32	4	2	1	1	4
Colo. Springs, Colo.	47	40	4	2	1	-	-
Denver, Colo.	105	68	22	11	1	3	5
Las Vegas, Nev.	213	141	51	12	4	5	10
Ogden, Utah	30	21	4	3	1	1	1
Phoenix, Ariz.	112	70	22	9	4	7	6
Pueblo, Colo.	24	13	8	2	1	-	3
Salt Lake City, Utah	116	74	25	9	6	2	10
Tucson, Ariz.	146	103	29	10	4	-	7
PACIFIC	1,603	1,088	332	114	42	27	105
Berkeley, Calif.	13	8	4	-	-	1	1
Fresno, Calif.	147	108	24	9	5	1	13
Glendale, Calif.	11	9	1	-	1	-	1
Honolulu, Hawaii	90	62	20	3	3	2	3
Long Beach, Calif.	72	53	15	3	1	-	3
Los Angeles, Calif.	308	204	59	27	13	5	29
Pasadena, Calif.	U	U	U	U	U	U	U
Portland, Oreg.	117	78	30	7	1	1	2
Sacramento, Calif.	177	113	38	20	3	3	13
San Diego, Calif.	146	89	36	14	5	2	5
San Francisco, Calif.	83	48	23	6	3	3	9
San Jose, Calif.	137	107	18	9	2	1	9
Santa Cruz, Calif.	27	17	7	2	-	1	3
Seattle, Wash.	126	89	24	9	2	2	7
Spokane, Wash.	53	38	10	1	1	3	4
Tacoma, Wash.	96	65	23	4	2	2	3
TOTAL	11,318¶	7,460	2,456	809	346	241	657

U: Unavailable. -:No reported cases.

* Mortality data in this table are voluntarily reported from 122 cities in the United States, most of which have populations of ≥100,000. A death is reported by the place of its occurrence and by the week that the death certificate was filed. Fetal deaths are not included.

† Pneumonia and influenza.

§ Because of changes in reporting methods in this Pennsylvania city, these numbers are partial counts for the current week. Complete counts will be available in 4 to 6 weeks.

¶ Total includes unknown ages.

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